



FluxReader Status and Update

Gareth Kafka
Harvard University
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Outline



- Framework Overview
- Usage
- Documentation
- Tutorial Session



Framework Overview



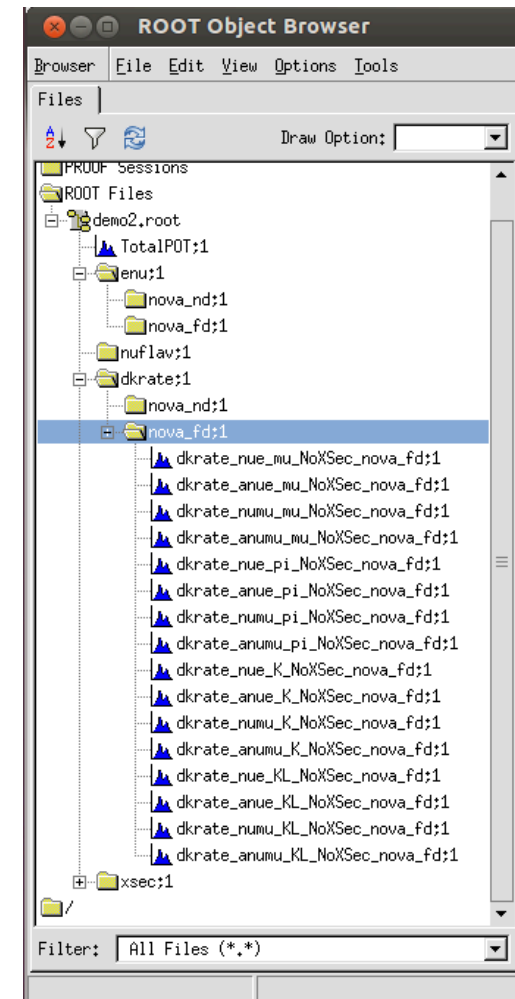
- FluxReader is a framework designed to read flux (dk2nu) files
- It is READY FOR USE by anyone
- It is run by writing and running compiled ROOT macros
- The purpose of the framework is to generate a lot of similar plots quickly
 - Energy histograms for each neutrino flavor
 - p_T vs p_z plots for neutrinos from each parent species
- It can apply cross sections and external weights automatically
- POT information is saved as well, so the user does not need to remember to write this down



Input/Output



- FluxReader takes Dk2Nu files as input, and outputs a ROOT file to a user specified location
- The file is organized based on the type of Spectra produced, then further subdivided by plots at a specific detector





The User Can Configure:



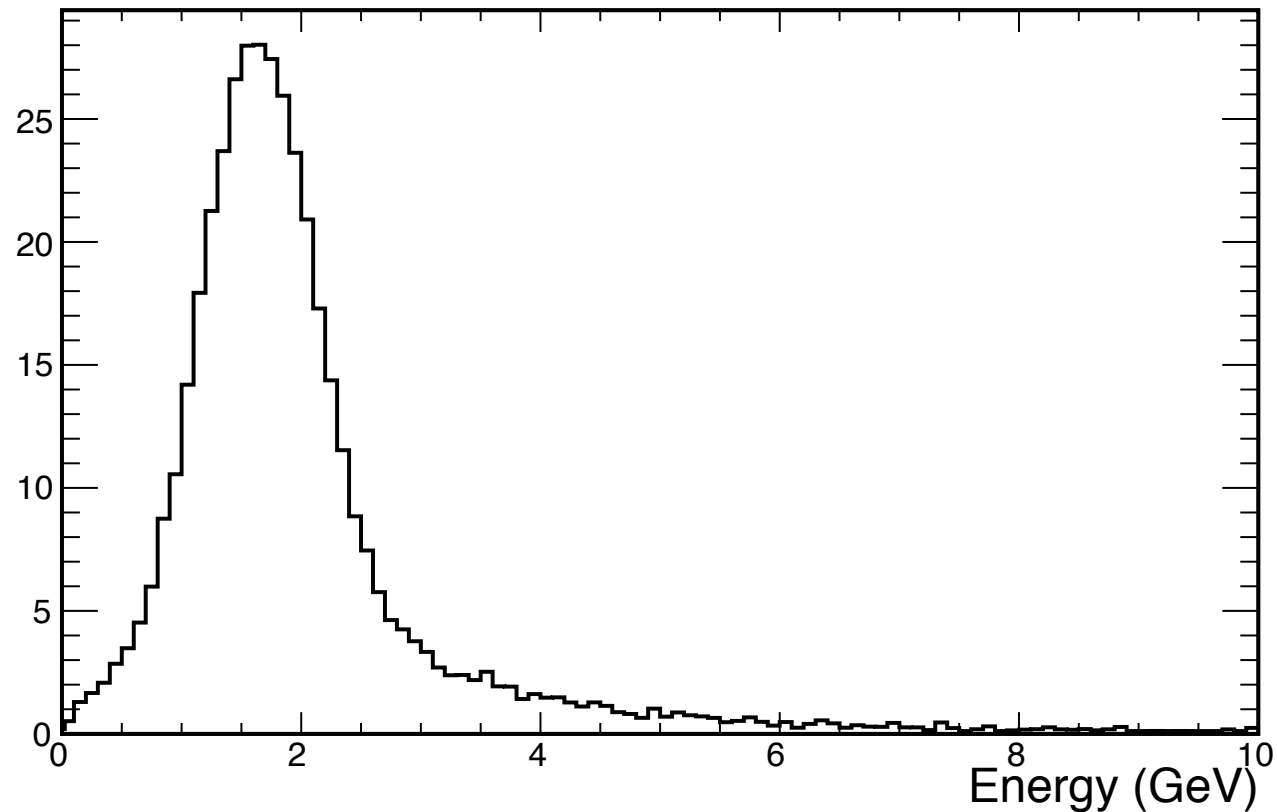
- Neutrino flavors, parent species, applied cross sections, detectors
- Histogram type, binning, dimension
- Variable to fill, weights/cuts to apply, external weight logic
- Number of times to smear a neutrino ray through each detector



Usage Examples



- Neutrino Energy Spectra
- At NOvA ND, ν_μ , from pions, no applied cross section

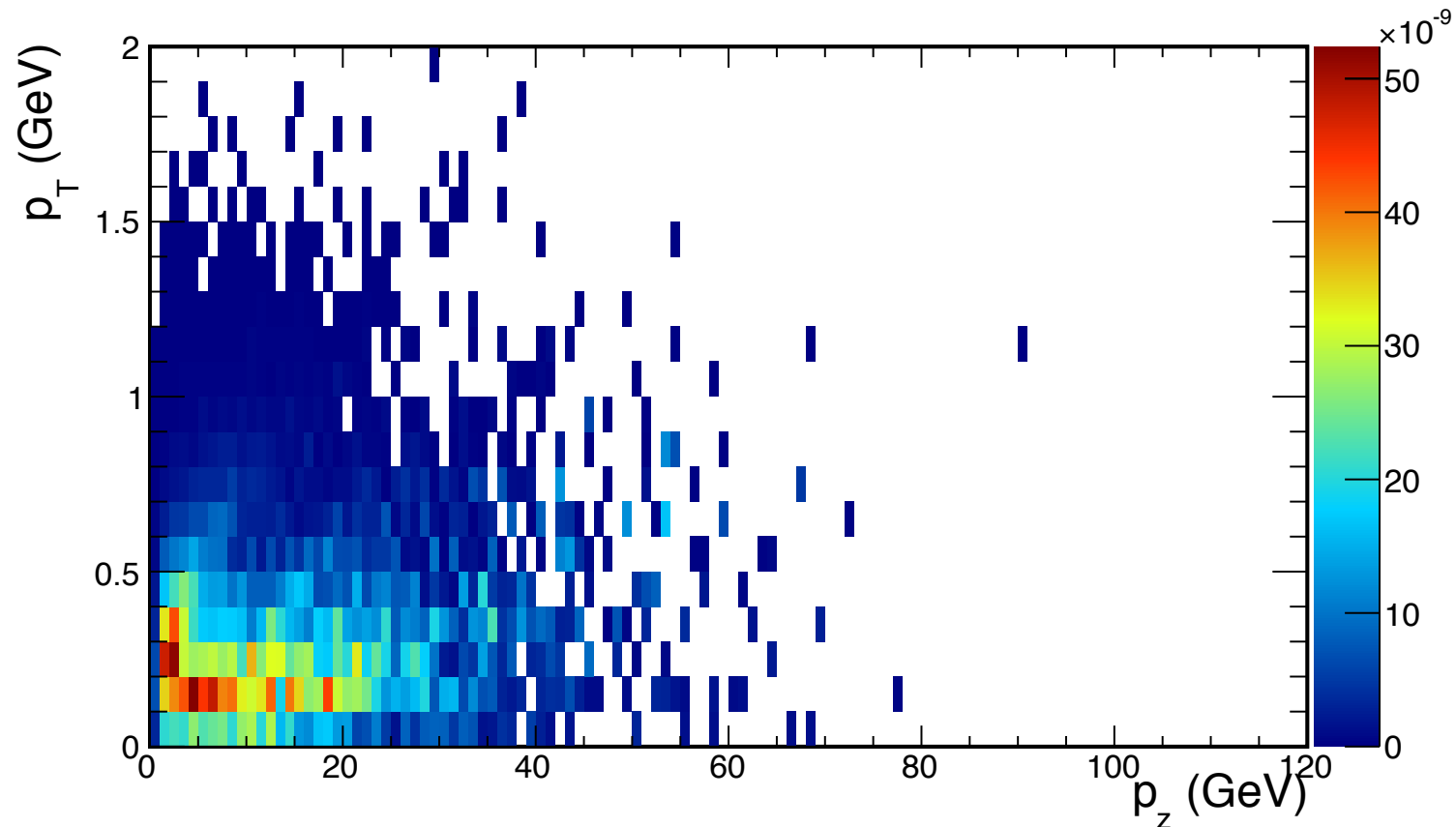




Usage Examples



- Parent p_T vs p_z
- At NOvA FD, anti- ν_μ , from kaons, no applied cross section

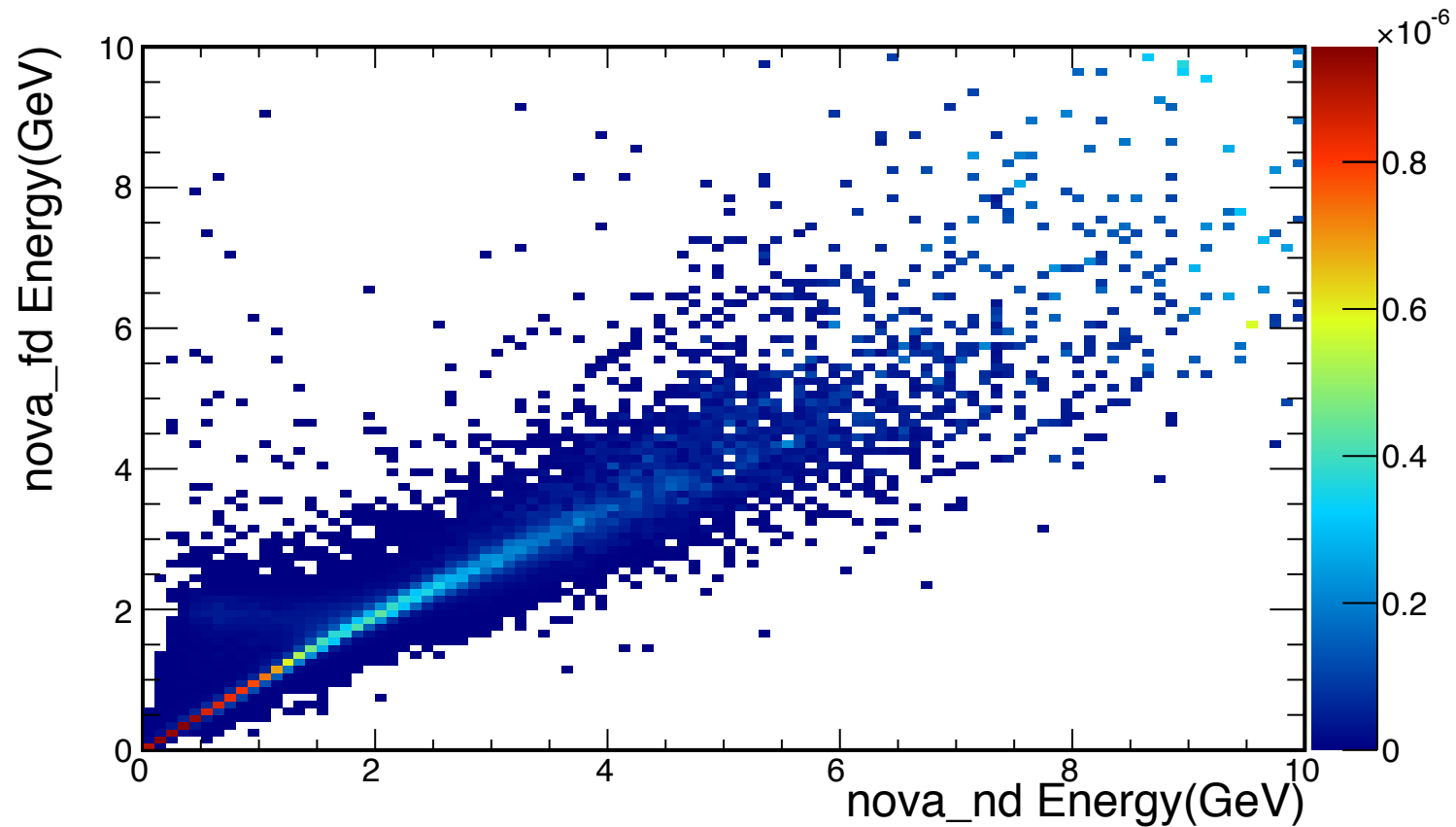




Usage Examples



- Beam matrix
- All ν 's, from pions, no applied cross section





Access



- FluxReader exists in its own repository, independent of any single experiment
- The FluxReader Wiki has details on checking out and building the framework
 - <https://cdcvcs.fnal.gov/redmine/projects/fluxreader/wiki>
- The details on the Wiki have been tested
- Users can check out the code and make local edits, but these changes cannot be committed
- Please email for Gareth (gkafka@fnal.gov) for requests



Documentation



- Internal code is thoroughly commented
- Six demo scripts exist, the first showing the bare essentials to run FluxReader, and subsequent scripts build in complexity
 - The scripts are labeled as Demo#_<Tutorial>.C, where # gives the order, and <Tutorial> describes what the script will demonstrate
- FluxReader Wiki!!!
 - <https://cdcvns.fnal.gov/redmine/projects/fluxreader/wiki>
- Tech Note to follow



Tutorial Session



- Some time next week, there will be a tutorial session
- This will go through each of the demo scripts
- Details (date, time, connection) to follow



Back Up Slides



Navigating TO the Wiki



- This is information I found useful and wanted to share
- Starting from any one Wiki page, like NOvA's...

Click on this “Projects” link



Navigating TO the Wiki



- Scroll down through the list of projects to find what you want, like NuMI-X, FluxReader, NuUtils, etc.

Projects - Fermilab Redmine - Mozilla Firefox

https://cdcs.fnal.gov/redmine/projects

Most Visited cplusplus.com doxygen Facebook Gmail Google Maps Manipulating Flux Files NOVA Doc DB NOVA-ART Wiki NuMI Beam Sim Wiki ROOT Wikipedia

NDOS

Near Detector

Near Detector Module Filling

Scintillator filling activities

NOVA Data Quality

This is project to use the offline software to validate short and long-term behaviour of NOVA detector.

Shifts

NuMI Beam

The goal of **NuMI Beam** project to share common simulation and analysis efforts amongst the NuMI experiments (e.g. MINOS, Minerva, ArgoNeuT and NOVA)

To access the rest of this project you must be a member of the **NuMI-X** group and agree to abide by the rules of the group. Those with redmine access are in the list to right....

NuMI Beam Simulation

A sub-project of **NuMI Beam** for simulation efforts, including g4nuMI and flugg as well as the obsolete pbeam and mars code.

nusoft

NuSoft-ART

NuSoft code written in the ART framework

nuSTORM

nuSTORM Project and Repository

NuUtils

A overarching project for neutrino related code not related to the ART framework

Dk2Nu

This package consolidates the disparate formats of neutrino beam simulation "flux" files.

There is code to define the ROOT TTree format, assist in filling it in the beam simulations, and an interface to GENIE.

These "flux" files encapsulate information about the hadron or muon decay the gave rise to a neutrino. Using the particulars allows the re-evaluation the probability (and energy) of the neutrino ray passing through any arbitrary point....

FluxReader

A framework for making distributions from "flux" files (e.g. Dk2Nu files)

G4NuPhysicsLists

Alternative Geant4 PhysicsList Factory and specialized neutrino-oriented PhysicsLists.

Current lists beyond G4 supplied lists: NuBeam

PhysicsLists can be acquired from the g4nu::G4PhysListFactory based on a name string; the factory is extensible by allowing new lists to register themselves (thus not requiring the factory to be recompiled to extend known lists)....

ORKA

Project for the ORKA $K^+ \rightarrow \pi^+ \nu \nu$ experiment

FluxReader is a subproject of NuUtils